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ABSTRACT

This teacher's manual provides ideas and suggestions for integrating the booklet "Women, Numbers, and Dreams" into the mathematics program. Shade-ins and role playing are each described, and a timeline to "flesh out" the world in which women live is presented. Discussion questions for each of the 11 biographical stories about 13 women are provided to serve as a review of the stories and to help relate the stories to the students' own lives. Suggestions for projects are then given for computers, education and career awareness, teaching science concepts, community involvement, animals, and puzzles and games. Finally, two model lesson plans are given as examples of how such activities, discussions, and projects can be developed around a particular story in the book. (MNS)

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ED279509

WOMEN, NUMBERS AND DREAMS

BIOGRAPHICAL SKETCHES AND MATH ACTIVITIES

TEACHER'S MANUAL

SE 047 776

Teacher's Manual

Women, Numbers and Dreams

Teri Hoch Perl & Patsy Christner

Written under a grant from the Women's Educational Equity Act Program, 1980/1
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Introduction

This teacher's manual has been written to provide ideas and suggestions about how to integrate *Women, Numbers and Dreams* into your program.

Women, Numbers and Dreams was written for several reasons. First, it was written to provide role models for young people. By sharing the stories of many interesting women who have worked in careers that require substantial training in mathematics, we hoped to encourage aspiration to careers in math related fields. We included both contemporary and non-contemporary women to provide contrast, for discussion, between situations faced by such women today and in the past.

Research, as well as common sense, indicates that enjoyment of mathematics is important in encouraging young people to continue studying mathematics. Therefore, math activities have been included to show that mathematics is far more than the arithmetic learned in elementary school. In fact, math can be a very pleasant, challenging pastime. Elementary number theory concepts such as prime numbers, triangular numbers, and common multiples, are reinforced in the math shade-ins, where a picture tied to the story provides appealing rewards.

Since providing role models is one of the prime objectives of the book, role playing, a technique for "getting into the characters," is described and suggested as a technique for helping young people do so.

A time line, a useful device to "flesh out" the world in which the women live, is described and elaborated.

Discussion questions are provided for each section to serve as review of the stories and also to help relate the stories to the student's own lives.

A series of suggestions for projects, grouped by topics, are included to further extend the ideas and subjects suggested in the book.

Finally, we include two model lesson plans as examples of how such activities, discussions and projects can be developed around a particular story in the book.

It is hoped that the use of these suggestions will help make *Women, Numbers, and Dreams* a most important contribution to your program.

SHADE-INS...AN APPEALING REWARD

Experience has shown that math shade-ins are an extremely popular activity with students. Shade-ins may be used in many ways. They may be used as originally intended, to practice a math concept after it has been introduced.

Sometimes the shade-ins may be used to introduce a concept. Students may be given a target list of numbers and can color the shade-in while trying to discover the rule which generates the list.

Some teachers have used the shade-ins with younger children as an open ended coloring activity. Sometimes the teacher, or a student, may read the biography aloud to the class as the students are coloring the shade-ins.

Although originally intended to be colored with pencil or pen, ending as black and white pictures, some teachers have suggested students color all 'white' regions one color ...for example, yellow...while coloring all 'black' regions any mix of colors. This results in colorful pictures...sometimes a welcome change from the black and white originally intended.

It is suggested that the shade-ins, as well as other activity pages, be duplicated from photocopies of the original pages.

ROLE PLAYING...AN EXTENSION OF PLAY

Role playing can provide a way of 'getting into' the characters in the book at a deeper level. (Role playing is an activity for an emotionally mature group of students. Try to judge whether the group will be able to profit by the role play before proceeding.)

Role playing is an extension of play. When they are very young, children play as a way of exploring their environment. As they grow older, they play to experience different roles which seem interesting. Through such play, the child tries to experience, thus understand, the real world relationships associated with a given role.

HOW TO DO IT...THE ENVIRONMENT

Successful role playing requires a trusting environment. Certain techniques can be useful in setting the mood. For example, closing eyes makes thoughts and actions seem more private.

"Close your eyes and listen for sounds, "...(after 3 minutes)..."open your eyes and list as many sounds as you heard," or..."close your eyes, relax your whole body, now tighten your right fist, now relax," or... "Close your eyes. You are in a cool meadow. What do you see?", or... "Close your eyes. Make your face show your anger, your happiness."

It is important that students know they will not be embarrassed or criticized for any response they make. Inappropriate responses require additional guidance rather than negative feedback.

Signals may be used so that students need not fear being caught unprepared. "When I tap your shoulder, describe what you see in the meadow."

Students should feel they have some control over when and how they will perform. "When you are ready to perform, step out of the line and the group will stop their rhythmic clapping. When you are finished, step back into the line and the clapping will start again."

Everybody plays. Role playing can be more stressful when some are the players and some are the audience. Avoid such divided situations by involving the entire group or having students work with partners.

Role playing may be supported by props in the environment and through information gathered by reading and research. It can be stimulated by questions such as "Where are you? What tools do you have? What would you do first?"

Never say, beforehand, how long a role playing session will last. The teacher must be free to end the session at any point that the play no longer seems purposeful. A natural signal to stop (for example, when students begin to seem self-conscious or silly) might be to ask a question such as, "Is this the way you think it would really happen?"

Beginning role playing sessions should last less than five minutes. Longer sessions will evolve naturally, as experience develops.

You may want to practice role playing techniques with your class before using such techniques for the roles in this book. In this way, anxiety will be minimized and attention will be productively focused when you use them here.

TIME LINE...TO "FLESH OUT" THE WORLD

A time line bulletin board can be both a valuable data source as well as an important memory aid. Make a time line for the years 1775-2000 using the names of the women included in this book as the initial data. Add information about events in their

lives in the appropriate time slots. As the unit progresses, add names of other famous people, discoveries, and inventions, within similar time frames. It may be helpful to use colored strips or dots to code various events; for example, green for inventions, blue for names of women with math/science backgrounds, purple for outstanding accomplishments, and so on.

Use the time line to generate answers to questions. One level might deal with facts; for example, a question such as "In what year did Evelyn Boyd Granville graduate from Yale with a Ph.D.?" Another level might deal with relationships. "Why was the father of Mary Somerville away so much during her childhood?" (The years were 1770's and 1780's. He was an Admiral in the English Navy.)

Questions could focus on one period on the time line. "Tell about one of the women who was born during the 1800's that you would have wanted to meet. At what time of her life would you have wanted to meet her?"

Appoint a 'Time Line Committee of the Week'...a group who would place entries on the time line and would formulate questions based on it.

DISCUSSION QUESTIONS

The discussion materials which follow are based on each biography. At the beginning of each is an italicized section containing questions to stimulate overall review of the stories. Below, **Review of Story and Related Questions** contains both recall questions and questions designed to challenge the student reader to think about issues raised in the biographies as they might relate to her or his own life. In all cases, the details of the story are not nearly as important as their relevance to the student's own experience.

Mary Somerville

Mary Somerville had a thirst for learning, perhaps developed by her childhood explorations. What did she teach herself? What practices of the l800's did she have to suffer through?

REVIEW OF STORY AND RELATED QUESTIONS

...How did Mary occupy herself while her father was away in the English Navy? What do you do for entertainment when you are alone?

...How was it discovered that Mary was reading late into the night? How would your parents know that you were staying up beyond your normal bed time? Would your parents be upset to know that you had taught yourself geometry?

...Mary overheard a conversation where the study of a book was cited as necessary for mathematics preparation. What book was it? What books have you considered for your self-education?

...Who helped Mary to compensate for her poor spelling? Is there a learning problem, specific or general, that you would like to overcome? What do you do when you get tired or distracted?

...How did Mary improve upon the French version of *The Mechanism of the Heavens*? Have you ever thought about how you might improve any of your books in order to make them easier to understand?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Ada Lovelace

The summit of Ada Lovelace's work was her paper about the Analytical Engine. How did she come to write the paper? What was her prediction about the use of the computer which was to come true 100 years later?

REVIEW OF STORY AND RELATED QUESTIONS

...In 1833 Ada had her "coming-out" season where she met many famous, intellectual and witty people. Whom did she meet? If you had such a party, whom would you like most to invite to meet and talk to?

...What mathematical subjects did Ada teach herself? What games or concepts have you taught yourself?

...Ada was invited by Charles Babbage to view the Difference Engine. She was fascinated by it. Describe what it could do. If it had actually been manufactured, how could you have used it in your play? Your work? Why?

...Why didn't Ada write a separate original article about the powers and limitations of Babbage's Analytical Engine? Have you ever taken an unassertive position for the same reason?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Sonya Kovalevskaya

Sonya traveled in vain to find the love that she felt was denied her in childhood. She traveled also to find a teaching position for which she was qualified. On a map, trace her journeys from Russia where she was born. What was the purpose of each trip?

REVIEW OF STORY AND RELATED QUESTIONS

...What unusual source did Sonya use as a learning material? What is another source of learning different from a book?

...A friend of the family convinced Sonya's father that she had talent of which he was unaware. How do you communicate with your parents about your studies? Do you keep them informed?

...Describe Sonya's scheme to be allowed to go to college. What's the difference between a scheme and a plan? What is your plan for continued education after high school?

...Through the assistance of her teacher, Weierstrass, Sonya finally received an appointment suitable to her qualifications. What position did she fill and in what country? Have you considered some day studying or working in another country? How do you think this might be different than in the United States?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Mary Boole

After nine years of marriage and the birth of five children, Mary Boole's husband died. How did she support herself and her family during the remaining fifty years that she lived?

REVIEW OF STORY AND RELATED QUESTIONS

...As a child, Mary waited on her sick father and followed his teachings about health. What health practices did she follow? What do you do to keep yourself healthy?

...What was significant to Mary about Monsieur Deplaces' approach to teaching? Have you ever had a teacher whose teaching approach made learning easier? Describe her or his approach.

...What was the Sunday Night Conversation? Do you have a regular club meeting or gathering that you enjoy?

...Mary considered herself a mathematical psychologist. The books she wrote suggest both mathematics and psychology. What job does mathematics and writing suggest? What is suggested by surgery and animals?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Emmy Noether

Emmy Noether lived in a calm, stable environment in Germany until she was fifty years old. Then a great change occurred. What was it? How did the changing of rules, laws and government alter Emmy Noether's life?

REVIEW OF STORY AND RELATED QUESTIONS

...How did Emmy's father help her to break the typical pattern of a young woman of her time? How did his position at the University of Erlangen open more opportunities for his daughter? Has the attention or influence of a friend or relative ever been helpful to you?

...For three years, Emmy worked at the University of Gottingen without a salary. What position did she have? Do you do work for your family for which you are not paid? Under what conditions would you work for someone with little or no pay?

...When did Emmy talk to the "Noether Girls" outside class time? Do you know an adult who generously devotes time to young people, sharing special interests?

...Emmy taught at Bryn Mawr College. What other job did she have? Do you think you would like to give lectures, demonstrations or write books about your job?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Lenore Blum

Lenore Blum had a long standing desire to attend the university of her choice. Describe her unusual involvement with M.I.T.: How long she was aware of M.I.T.'s existence, how she became a graduate student at M.I.T., and her role there as both student and mother.

REVIEW OF STORY AND RELATED QUESTIONS

...Lenore had many strong role models. Who were the family members who passed on the family tradition of scholarship? Who in your family has gained respect and a reputation for her or his scholastic achievements?

...After Lenore decided to quit the local school, how did she and her sister continue their education? Have you ever had a tutor for a special learning session at home, or to make up for a long absence from school? Has anyone helped you study for exams or review during the summer?

...Who set the 1:30 curfew for Lenore? Who sets your study times or curfew times? Do you ever consider setting your own limits?

...Lenore was not admitted to M.I.T. at first, supposedly because of limited dormitory space for women. What did Katharine McCormick do to change this? Have you ever been excluded from any situation because of your sex?

...Why did Nancy Kreinberg and Lenore Blum work together? Give examples of how people decide to work together or when they must work together.

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Evelyn Boyd Granville

Evelyn Boyd Granville received considerable support, both personally and professionally, from many people; she also experienced racial and sexual discrimination. With her superior qualifications and skills, however, she was able to overcome many barriers. When did Evelyn Granville receive full support? When did she experience limited acceptance?

REVIEW OF STORY AND RELATED QUESTIONS

...Where did Evelyn get her first year college tuition? How might one finance a college education today?

...Evelyn had originally planned to be a teacher. What caused her to change her mind? What jobs have you considered since you were a small child? Have you changed your mind since then? Why?

...What differences did Evelyn notice between academic standards among Fisk University students and those at Los Angeles State College? Which of these colleges probably sends a larger percentage of students to graduate school? Why? What do you think about the quality of your school's academic classes?

...Evelyn, together with Jason Frand, wrote a book on how to teach mathematics. What was the title of their book? What do your math teachers do to help you learn and enjoy mathematics?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Fanya S. Montalvo

Fanya Montalvo's family came to the United States from another country. They spoke both Spanish and English. They also loved sci... .. Fanya developed scientific ambition as she grew from a child to an adult. How did a brother, a homemade rocket, two teachers, a rock band and a luncheon date help Fanya choose her present job?

REVIEW OF STORY AND RELATED QUESTIONS

...What did Fanya's father do to challenge his children's thinking? What activities that happen in your home, or at the home of your friends, help sharpen your thinking skills?

...Why wasn't Fanya able to go to the college of her choice? What could a school counselor have told her to increase her awareness of the importance of outstanding grades for acceptance at outstanding colleges?

...Fanya received a great deal of practice being in front of an audience. Where did she perform? How did it help her in graduate school? What have you done for fun that has helped your school skills?

...Even though she was qualified, Fanya wanted to get a job rather than go directly to graduate school. Her teacher and advisor helped get her first job. Where was the job? Is there a teacher or friend who might recommend you for a job?

...What is A.I.? What would you have a "smart machine" do for you?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Edna Lee Paisano

Edna Lee Paisano had a strong, supportive family and great loyalty to her people and culture. How did these influences guide her career?

REVIEW OF STORY AND RELATED QUESTIONS

...What jobs did Edna Paisano do to help her parents and grandparents? What jobs do you do for your family? What might you do for them in the future? In 5 years? 10 years? 40 years?

...Edna attended summer camp and in later years was employed there. What jobs did she have? Would you like to work with children at a summer camp?

...Edna didn't know how math could be useful to her people. What other choices did she consider as a career? What jobs have you considered?

...What part did the government have in the jobs of both Edna's parents and in Edna's career? What training or schooling programs are subsidized by the government now?

...How did her health limit her activity? What job characteristics did she consider when she changed jobs? What is important to you about job conditions?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Grace Yang

Grace Yang was raised in China where most parents have high academic expectations for their children. In fact, her mother rewarded her with gifts for high class ratings. When did she first become aware of the limits put on career choices for girls? After obtaining her college training, did she have problems getting a job?

REVIEW OF STORY AND RELATED QUESTIONS

...One of Grace's professors helped her change her major field of study. What subjects were involved in this change? Why? Have you ever signed up for a team or class and then changed your mind? Did someone help you change your mind? Who?

...At the present time, Grace is doing a study to determine what Americans eat compared with what they need nutritionally. Do you ever check food package labels for nutritional information?

...As a professor of statistics, Grace often sees capable, sometimes brilliant, female students. The lack of females on faculties in statistics departments seems to contribute to the low number of women pursuing careers in statistics. How many women out of ninety faculty people are in the mathematics faculty at the University of Maryland? How many of the nine faculty people in Grace's statistics department are women? What aspect of Grace's job appeals to you the most...teaching, consulting, gathering data, analyzing data, or reporting research results?

...Grace Yang's father predicted that with both a career and a family, Grace would constantly be working, either at the office or at home. Did her father's prediction come true? What has been Grace's reaction? Does your mother or the mother of a friend work at a job outside the home? How does her job affect her family and others around her?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

The Wisconsin Three
Jean Darling, Sally Handy-Azrnstorff and Kathi Dwelle

This story is about three women who are computer consultants. Two have mathematics degrees. One does not yet have a four year college degree. How is it possible to obtain such a position without a bachelor's degree? What training must people have today to be hired as a consultant at the Madison Academic Computing Center?

REVIEW OF STORY AND RELATED QUESTIONS

...Jean Darling works as a consultant and also attends college. For what degree is she working? Why would a person continue classes after she or he already has a job?

...How does Jean think the computer can unite community organizations? Can you think of any specific work computers could provide the Girl Scouts or Boy Scouts, the Gray Panthers, or other community groups?

...Sally Handy-Zarnstorff's career options were increased when her high school teacher started a computer programming course. What computer languages did she learn? What computer classes are available to you? At what cost?

...How is it possible that Sally is able to do private computer science consulting at home? What other kinds of salaried jobs can be done at home?

...Why didn't Kathi like the job conditions of a programmer at IBM during the 1960's? What kind of job environment is important to you?

...What aspect of contract programming does Kathi like best? Have you talked to someone in the field you are considering?

...Jean, Sally and Kathi like computer science because work conditions are flexible. What special options does it give each of these women? Would you like to work in computer science? Why?

TEACHER'S NOTES

Have students make additions to time line. Note additional ideas for role playing.

Individual or Small Group Projects to Pick and Choose

These stories may have sparked your enthusaism. Choose a project to explore these new interests further. Doing this may lead to the development of new skills and awareness. Sharing what you learn may help other students grow.

Look over the following topics and suggestions. They are grouped by subject areas. Pick one or two projects to explore with a partner or small group. You may already have your own idea for a project you would like to do. After you have done some preliminary thinking about a topic, sources of information, and methods of presentation, use your teacher as an advisor.

ABOUT COMPUTERS

- The Analytical Engine of Ada Lovelace's time was most amazing since it was not powered by electricity. Discuss an interesting aspect of a contemporary computer...such as printing, graphics or satellite communication.
- Ada is considered to be one of the first computer programmers. Describe how to write a short computer program.
- Demonstrate or talk about computer music.
- Mary Boole was not allowed to teach, but as a librarian at Queens College she influenced many. The occupation of librarian has evolved since the 1800's. Mary would be pleased to see mathematics as a significant skill for the modern librarian who needs to be able to deal with computerized catalogue systems. Describe the role of computerized information in a modern library.
- After doing consulting, Kathi Dwelle went into the graphics department where she learned to design special plots and three-dimensional programs. Explain some aspect of computer graphics to your class. Show examples of graphics output.
- Produce a computer users dictionary. Use words and phrases you find in this story and others you know. Define the words and give examples in a sentence where possible.

ABOUT EDUCATION AND CAREER AWARENESS

- A resumé lists jobs held and duties performed. It also includes recommendations from employers. As many other people have done, Evelyn Granville changed jobs several

times as her interests changed and as the availability of the jobs themselves shifted. As she applied for new jobs she presented her resumé. Make up a resumé that includes your experiences so far. Then make up a second resumé. Include in it what you hope it will contain when you are thirty.

• Evelyn attended Smith College at the suggestion of one of her high school teachers. Give a short talk on one of the colleges in your area or any other school that seems interesting to you. Discuss the advantages and disadvantages of single sex versus co-educational schooling.

• Mary Somerville won a silver medal for solving an algebra problem. Have you ever won a contest based on skill? Tell about it.

• After deep concentration in her 'think tank,' Lenore Blum came forth with one simple but powerful rule to solve her logic problems. Give the class three logic problems and let then think about them a few days before you help solve them.

• French, Latin and Greek were languages learned by Mary Somerville. Give some phrases or bits of wisdom written in these languages, and explain their meaning.

• What was the title of Sonya Kovalevskaya's research for the Prix Bordin competition? What competition or involvement is available today in your school, school district, state, and at a national or international level?

ABOUT TEACHING SCIENCE CONCEPTS

• Mary Boole was all for getting rid of learning that was as "dry as dust." Using straws, show the class how to make a three dimensional figure, a tetrahedron, cube, or octahedron. Teach curve stitchery to the class. Prepare marked cards and supply needles and yarn.

• Demonstrate rocket flight and explain how it works or illustrate the process with diagrams. Is your demonstration like Fanya's experiment? Give a demonstration that shows a law of physics.

• Edna Paisano's awareness of her people and other American Indians and Alaskan Natives allows her to better analyze the data she works with. Try your hand at gathering information and analyzing it. Write a ten item questionnaire about continuing education after high school. Review and revise your data form. Poll the class. Tally your results. Evaluate the data (draw conclusions). Present your results to the class in visual format (graphs, tables...).

• Sonya Kovalevskaya has given us information about Saturn which is still considered valid today. Give a talk about a planet. Tell what the photographs from Voyager I have revealed.

ABOUT COMMUNITY INVOLVEMENT

• Lenore Blum was able to see a need for new approaches to increase the participation of women in math related fields: pre-calculus at Mills College and a support group for women in mathematics and science. Research and describe the purpose of the Math/Science Network or EQUALS program.

• In 1881, the "woman issue" was a subject of great debate. How did Sonya Kovalevskaya show she was a feminist? Research and share your knowledge about women's issues today as they involve equal rights, the ERA, and affirmative action in jobs.

• As a young girl, Evelyn Granville participated in her city's library and recreation programs. As an adult she is active in her church. Describe what community and volunteer work is available and needed in your area. What volunteer work might you do, while you are in school, to develop the experience that may help get a "first" job in your chosen field?

ABOUT ANIMALS

• As a child, Mary Somerville spent many hours at the beach, which was a part of her back yard. Research and teach the class something about natural science, such as birds, plants, or sea life.

• Fanya Montalvo has taught her bird to say "pretty bird." Describe how to teach a bird to speak or how to train a pet to do a trick.

• Mary Somerville loved animals and birds all her life. As an adult, she petitioned the lawmakers of England and Italy to outlaw cruel practices toward animals. Tell about the work of the S.P.C.A. or Humane Society where you live.

• Ada Lovelace enjoyed horseback riding. Describe how to care for a horse.

ABOUT PUZZLES AND GAMES

• Play the game 'Twenty Questions' with the leader writing the name of one of the women in the book, on a slip of paper, and answering questions about her personality with "yes," "no," or "I'm not sure."

- Select a puzzle from one of Fanya Montalvo's favorite game books: *One, Two, Three Infinity* by George Gamow--or from another puzzle book--and explain it to the class.
- As a child in elementary school, Jean Darling loved mathematics. Games and puzzles were fun. She worked many of the puzzles in the back of *Scientific American*. Work some puzzles yourself and bring your solutions to class to share.

How to Incorporate Into the Classroom

Your use of these materials should be tailored to your students. The stories need not be used in chronological order. Below are two models for ways the materials may be used in your classroom.

EXAMPLES FOR YOUNGER CHILDREN (MARY SOMERVILLE)

- Read, or have students read, biographical sketch. Stress Mary Somerville's happy, independent youth, interrupted by arbitrary demands of adults. This is easy for children to relate to.
- Read first section about Mary Somerville's youth. Discuss period: clothes, events, jobs, wars, attitude toward children. Place Mary's name on time line.
- Role play: Imagine wearing Mary's brace; try to study. Put yourself in another kind of device; try to study. Talk about what you could and could not do if you were in such a device. Could you still go to school? To a museum? To the beach? To the soccer field?
- Review readings; focus on discussion questions.
- Continue filling in shade-in while the conclusion of story is read by the teacher.
- Draw attention to animal projects. Listen to one or two animal reports. Draw diagrams of animals; include a caption and labels. Talk about Mary's published diagrams.
- Reread the end of the story. "Close your eyes. Visualize Mary at age ninety. What is she doing? What evidence is there of her age? As I come around and tap on your desk, tell me in a few words what Mary is thinking."
- List jobs available in 1790's. Draw pictures of men working, women working, children working.

EXAMPLES FOR OLDER STUDENTS, AGES ELEVEN AND UP (ADA LOVELACE)

- Read biographical sketch. Stress Ada's interest in computers and music.
- Read focus question. Discuss. Skim story for details. Put Lovelace on time line. Try to place other information about computers on time line.
- Begin career scrapbook about computer science and music.
- Contribute to discussion questions.

- Contribute to discussion questions.
- Select projects, research material. Bring in recording of computer music.
- Teacher will read accounts of computer company environments...extremes...sweat shop, computer plus health spa...small company, large company.
- Role play being a computer company employee: "Who is going to be the boss?" Students may wish to organize their ideas into a structured play.
- Make a list of questions you still have about this field.